



## **Small pterosaur tracks in the Jinju Formation (Early Cretaceous), Gyeongsang Basin, South Korea: abundance of tiny pterosaur tracks in the East Asia**

Sujin Ha (1), Kyung Soo Kim (2), Jong Deock Lim (3), and Hyoun Soo Lim (1)

(1) Department of Geological Sciences, Pusan National University, Busan 46241, South Korea, (2) Department of Science Education, Chonju National University of Education, Jinju, Gyeongnam 52673, South Korea, (3) Cultural Heritage Administration, Daejeon 35208, South Korea

So far, many vertebrate footprints (avian, nonavian dinosaur, pterosaur, crocodylian and mammal tracks) have been found in the Early Cretaceous Jinju Formation, Gyeongsang Basin, South Korea, and Jinju Innovation City is one of the most outstanding tracksite. Particularly noteworthy is that pterosaur tracks are commonly found in this area, although pterosaur tracks are generally rare compared to dinosaur tracks in other areas. Besides, the pterosaur tracks in this site vary widely in their morphology, size, and degree of preservation.

Here we report new pterosaur tracks and trackway which are very small and well-preserved among various pterosaur tracks. Manus imprints have average values of 27.8 mm long, 9.0 mm wide, and 3.2 length/width ratio. Pes prints show average values of 27.7 mm long, 13.2 mm wide, and 2.1 length/width ratio. Small-sized (< 5 cm) footprints of pterosaur are rarely occurred around the world. At present, only four ichnospecies reported in the East Asia and Europe are valid: *Pteraichnus koreanensis* (Hasandong Formation, Korea), *P. nipponensis* (Kitadani Formation, Japan), *P. longipodus*, and *P. parvus* (Oncala Group, Spain). Despite their tiny size, small pterosaur tracks found in East Asia (*P. koreanensis*, *P. nipponensis*, and new tracks in this study) are well preserved unlike those found in Spain, and show marked difference in morphology attributed to the variation of manus divarication, and elongated trackways. Therefore, abundant small pterosaur footprints in the East Asia can provide various data of anatomical features related to phalanges and locomotion of tiny pterosaurs, and offer perspectives of taphonomic conditions for preservation of small tracks. Also, the temporal distribution of these tiny pterosaur tracks suggests the continuous habitation of small pterosaurs during the Early Cretaceous in the East Asia.